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hundred feet from the western mound, and the other mounds in the crescent are about eighty feet apart. The western mound is thirty feet in diameter, and when discovered was three and a half feet in height. The eastern mound is twenty feet in diameter, and when discovered was two feet in height. The other two mounds are twelve feet in diameter, but have been nearly obliterated by the ravages of time, by the burrowing of animals, and by the despoliation of curious people.

These mounds were discovered by John Davis, Esq., of Junction City, who formerly owned the land on which they are located. In the year 1879, he employed a man to open the mounds, who spent several days in exploring them. Selecting the largest mound, he dug a trench from the circumference through the center, carefully removing the dirt and stones, which, without order, were packed together in a mass. The limestones in large number, packed with the dirt, have evidently been taken from a stratum of the same, which outcrops lower down the bluff.

It proved to be a mound of sepulture. The bodies seemed to have been laid on the surface of the ground, without any order, and the mound of mingled dirt and stones raised over them. The mound has been well dug out, and the interior now presents a mass of limestones of all sizes promiscuously thrown upon each other. The stones and some of the bones still retain evidences of heat having been applied when the bodies were buried. The number of teeth found would indicate that perhaps eight persons had been interred. Numerous fragments of the most primitive pottery—apparently urns—were found in the mound. Probably a hundred beads of soft limestone, and of encrinites, were taken from the mound. The teeth found were generally sound; although some were worn to the gums, but one tooth was found decayed. It is almost a certainty that one mound-builder had the toothache. There was one pipe found, in the shape of a double moccasin, three inches in length from toe to toe. The bowl of the pipe was in the center an inch deep. The stem entered at one toe; the other toe had no orifice. This pipe was accidentally broken. Probably a dozen or two arrowheads were found. Some of the bones bore marks of the teeth of wild animals. Possibly a skirmish may have taken place between hostile parties at this point. After the bodies of the slain had lain on the field, and been partly devoured by wild animals, the remains may have been gathered up and buried in these mounds.

RESULTS OF SOME EXPLORATIONS AMONG THE PUEBLO RUINS IN NEW MEXICO.

BY J. R. MEAD, WICHITA.

In western New Mexico, twenty miles north of Grant station, on the Atlantic & Pacific Railroad, there rises to the height of over 11,000 feet the burnt volcanic mountain known to the Mexicans as San Mateo, and to the Americans as Mount Taylor. This mountain is associated with the mythology, traditions and superstitions of the Zunis, the Acomas, the Lagunas and Navajoes, who inhabit the country now, as they did in 1539, when Friar Marcos de Nieza and Stephanus first came to spy out their country. In the apex of this mountain is a natural cavity, in which the pueblo people believe the Deity of rain and thunder resides, for around its peak the clouds first gather which send their life-giving floods into the valleys below; and annually parties from each of the pueblos visit the summit of the mountain, and in the cavity deposit their offerings of meal, beads, and bundles of curiously-ornamented sticks and painted feathers, after which they perform their religious ceremonies with as sincere devotion as their Mexican neighbors kneel before the cross. From the cavity three paths, kept open and clear of leaves and grass, spread out to the southwest like a huge

turkey's foot, the one to the left pointing to the town of Lagunas; the center, to the pueblo of Acoma, in plain sight upon its high rock, thirty miles distant; the third, towards the Zuni pueblo. These paths are for the Deity of the mountain to walk in when he comes out to visit his people.

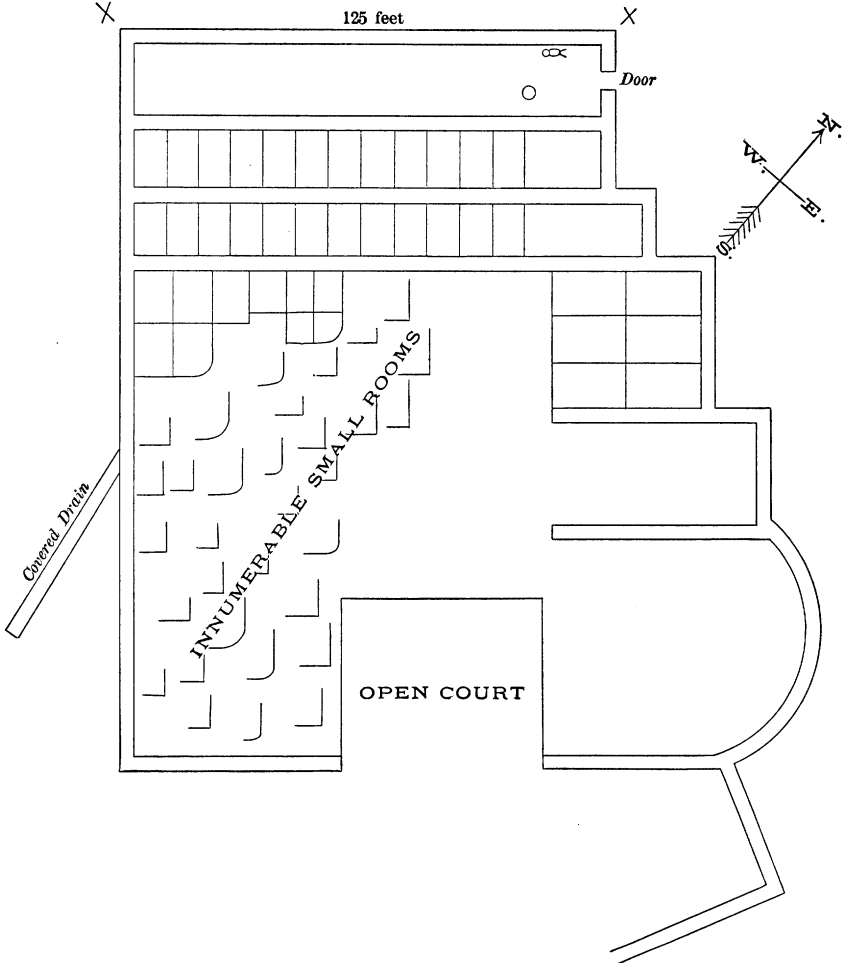
Down the northern slope of the mountain, through a forest of white-pine timber, runs a living stream of pure water, which supplies the primitive Mexican town of San Mateo, at the mountain's foot, and furnishes water to irrigate six or seven hundred acres of the valley, which the Mexicans cultivate as rudely as did the unknown people who builded a city and cultivated the same land centuries ago.

It was for the purpose of exploring these ruins that I visited this very interesting locality, especially interesting as it was but recently discovered by the owner of the land, Mr. Amado Chaves, with whose consent and assistance I employed some Mexicans and undertook to excavate the main central building, which, at a casual glance, appeared to be a natural mound of considerable size, composed of stone and earth, and covered with a scant growth of grass and weeds, but which proved to be a large communal building buried beneath the material of the fallen upper stories. Our excavation commenced at the northeast corner. Following the north wall 125 feet, which was standing to the top of the first story, 16 feet high, at the northeast corner we found a door 4 by $5\frac{1}{2}$ feet, entering from the surface a room 14 feet wide, 14 feet high, and 122 feet long, inside measure. This room was entirely filled and covered with the material of the three or four stories fallen from above it. The door had been roughly stoned up from the outside, after the destruction of the building (as I afterward found), by people who had builded upon the ruins of the original building, and in their turn had been destroyed. The walls of the building were made of hard, smooth stone, skillfully laid in adobe mortar. The outside walls were 18 inches in thickness, both faces smooth and true, the angles apparently true right angles.

Near the door we uncovered a skeleton, which crumbled to pieces on exposure to the air. Nothing was found with it but the hair, which had faded to a brown color. Reports at the time stated it to be a white woman with red hair, and a string of costly beads about her neck. The loose material filling this room consisted of the fallen walls, adobe and cement floors, mingled with ashes, charred beams and plank, and broken pottery. Of at least three stories above in the original construction of the building, there was an accumulation of two feet of waste material—broken stone, mortar, pottery, &c. Instead of removing this, the builders had smoothed and pounded it down, plastered it with adobe mortar, and then covered it with a cement made of burnt gypsum, ashes, and pounded pumice stone, making a smooth, hard, white floor. The walls of the building rested upon the original surface of the soil. About fifteen feet from the entrance we exhumed a necklace of beads made from shells, jet, silver, and a large and beautiful turquoise. In course of our excavations we found numerous pottery vessels of various styles and patterns, broken metals, the bones of deer and turkeys, and charred corn-cobs of a very small variety. The building extended 150 feet south of this room, and was composed of innumerable small rooms, the labor of exploring which was far too great for me to undertake. The eastern wall was very peculiar—consisting of projections, angles, and curves, a sketch of which is shown on the opposite page.

This ruin was situated on the north side of the rich valley at the foot of the mountain, and traces of the ditch which brought the mountain stream by a circuitous route around and above the cultivated land, through their town, could still be seen. On all sides of this central building were the scattered remains of former habitations. The earth seemed full of broken pottery, ashes, charcoal, flint-chips, arrow-points, and other debris, to a depth of several feet. At the foot of a low, sandstone ridge merely, a heavy rain exposed the top walls of a continuous series of connected rooms

an acre or two in extent, the walls sound and true as when first built. Burrowing coyotes enabled me to see four or five feet down the sides of some of these walls. This series of buildings were probably but one story high, and entirely buried by the blowing dust and sand. The burrowing animals (which were numerous) seemed to choose spots covering remains of some kind, as they invariably threw out pottery, stone-chips, arrow-points, and frequently, human bones. Wild potatoes grew plentifully about these ruins, and centipedes and rattlesnakes made their homes in the crumbling walls.



Across the valley, at the foot of the mountain, is a detached hill five or six hundred feet high, with precipitous rocky sides. The level summit, half an acre in extent, is entirely covered with the walls of rudely built houses. No traces of the timbers which once supported the roofs remain. These ruins are evidently of very great age. Pottery, ornamented and plain, abounds, and a few very delicate arrow-points of semi-transparent obsidian and agate were found, also turquoise beads and pendants worn in ears. In the abrupt south wall of the hill were the remains of cliff dwellings, built in every nook and cranny which would give them foothold. In

some instances the weathering away of the sandstone rock had carried away these little houses except the back wall and a deep bed of ashes, in which were bones of deer and birds, and vessels of pottery. I noticed several detached projecting rocks supported by a solid wall of stone laid in adobe mortar, and under the rock a bed of ashes two or three feet deep. On the east side of this hill, buried in the loose sand and earth, I found a human skeleton of unusual appearance. The bones were large, coarse and angular, the joints knotty, the legs excessively bowed, the skull small, with projecting jaws. It can be seen at the State University.

The Mexicans of San Mateo, only one or two of whom spoke English, told me of another ruined city, fifty miles northwest in an uninhabited country, destitute of water, and unknown to explorers. Waiting till the rainy season set in, I employed a Mexican guide well mounted, and set out in search of the unknown pueblo. An Indian trail followed alongside of or between walls of brilliant red and yellow sandstone 500 to 1,000 feet high. At an abandoned Navajo encampment we observed a number of Indian sweat houses made of poles leaning together, covered with bark and earth, air tight, large enough for one person to crawl in, first placing vessels of water inside, into which they put hot stones, while a friend outside closes the small entrance. The result is an extremely hot steam bath. The approach to the Continental Divide was very gradual; a carriage could be driven over our route by removing a few rocks and fallen trees. The divide is a level mesa half a mile in width, with a scattering, stunted growth of cedar, then in bloom, and the ground covered with the merest apology of a coat of grass, barely an inch high. At the western edge of the divide is a bed of calcite crystals, and lower down we rode over a cropping vein of lignite coal six or eight feet thick, of excellent quality. This vein extended along and cropped out of the high red-sandstone wall to our left like a black ribbon, for twenty miles, with 500 feet of sandstone above it, and the descending path we followed finally left it as many feet up the side of the cliff.

Towards evening of the second day the towering ruins we sought rose before us, situated on a gentle slope at the junction of two fertile valleys in the open plain. In the center of the town had been built the citadel, or fortress, its upper stories a fallen mass of ruins, except the center of the north wall, which, supported by a circular *estufa*, rose straight up from the ground for a distance of nearly 50 feet, including three full stories and a portion of the fourth. From the top of the first story, 16 feet above the ground, projected the ends of cedar beams 10 or 12 inches in diameter, indicating a veranda around the building. These projecting ends were so hard my knife failed to make an impression on them, yet the prevailing west wind had weathered away a quarter of their diameter on the exposed side. These heavy beams, more than twenty feet in length, were only found in the cañons of the high cliffs five miles distant. The north wall of this building was 136 feet in length, with a smooth, true face; six feet from the ground was a course of stone six to eight inches thick, and four feet long. With this exception the stone were of medium size, and decreased in thickness from the ground upwards. The first story contained 36 layers of stone, the second 35, the third 42, and the remnant of the fourth 31; in all, 144. Back of this building on rising ground is a circular *estufa* sunk in the ground, of unknown depth, as it is nearly filled with blowing dust. It is forty feet in diameter, a perfect circle, walled with smooth stone of uniform size, of 2x6-inch face. In front of the large building was a reservoir for holding water, supplied by a ditch running for half a mile west, which caught and conveyed the surface-water from a long slope in time of rain. We found no water except in pot-holes in the rock. A party of Navajoes passing, we offered them liberal pay to show us living water. They informed us there was none within a half-day's ride, and that a small spring to the west. On asking them what people built those houses, they referred to an old gray-haired Indian of their party, who after reflection said nobody knew—they were always there.

Abundant remains of lesser dwellings were on every side for a considerable distance around, and broken pottery very abundant. I exhumed one perfect skeleton, incased in dry adobe earth and covered with large, shallow, earthen vessels. The cranium would compare favorably with any European, and every tooth was perfect. The right arm had been broken, and united at an angle. I regretted my inability to bring this specimen with me for some of our State institutions.

The motive which decided the location of this pueblo was quite apparent. It was built near the point of a tongue of land at the junction of two fertile valleys, each of which were at the mouth of a large arroya, whose branches gathered the waters which fell in the high mesa in the rainy season, and poured them over the valleys at their mouths, where they sank into the loose, sandy earth, affording natural irrigation. Forty acres of corn were growing on this favored spot, planted by the Navajoes. I noticed no such stone as those used in the large buildings I have described, appear above-ground in the vicinity. The builders seem to have exhausted the supply. No names or inscriptions were found upon the rocks on this trip, and none found in the vicinity of the ruins. The scrubby timber growing in and about the ruins did not differ in appearance or age from that growing generally in the country. The only entrance to this large building was by a door at the northeast corner. The building faced southeast, as did the one at San Mateo.

Neither of the ruins I have described is marked in Wheeler's survey of the pueblo ruins of New Mexico, and the Indians and Mexicans stated they had never been visited by Americans to their knowledge. I saw numbers of lesser ruins in that section of the country. Pottery was scattered everywhere, even to the tops of the highest mountains. I conclude that the large buildings I have described are not of very ancient date—probably were built and occupied at the time of the Spanish conquest; but the ruins found by digging in the ground around them disclose the fact that other buildings preceded them which may be as old as man's occupation of this continent.

ADDITIONS TO THE CATALOGUE OF THE BIRDS OF KANSAS.

BY N. S. GOSS, TOPEKA.

The following observations have been made, and notes gathered, since the publication, May 1, 1886, of the Revised Catalogue of the Birds of Kansas.

PODILYMBUS PODICEPS. (Linn.). Pied-bill Grebe. June 8, 1886, I found the birds breeding in a pond in Meade county. I shot a young bird about two-thirds grown, saw several others, and caught a glimpse of an old bird, followed by little chicks not more than a day or two old.

PHALAROPUS TRICOLOR. (Vieill.). Wilson's Phalarope. June 8, 1886, I found three pairs of the birds breeding on marshy grounds bordering a slough or pond of Crooked creek, Meade county, and I therefore enter the bird as an occasional summer resident in western Kansas; during migration, quite common throughout the State; nests on the ground, usually on hummocks, quite deeply excavated, and lined with leaves from the old dead grasses; eggs, three or four—usually four—ground color, cream to ashy drab, rather thickly but irregularly blotched with varying shades of brown to black. The female is larger and brighter in color than the male, but from limited observations of the birds I am led to think certain writers are mistaken in reporting that the females arrive first and do all the courting, but leave the work of nest-making, incubating, and rearing of the young to the males. I have never been so fortunate as to find either of the birds upon the nest; but certainly